

43. (New) A synthetic Vpr peptide produced by the method of claim 40.

44. (New) A biological assay system comprising a synthetic peptide of claim 31 immobilized on a substrate.

45. (New) A biological assay system comprising a peptide fragment of claim 32 immobilized on a substrate.

46. (New) The biological assay system of claim 44, which comprises an ELISA.

47. (New) The biological assay system of claim 45, which comprises an ELISA.

## REMARKS

### I. Introduction

In response to the Office Action dated March 4, 2002, claims 31-33 have been amended, and new claims 34-47 have been added. Claims 31-47 remain in the application. Reconsideration of the application, as amended, is requested.

### II. Claim Amendments

Applicants' attorney has made amendments to the claims as indicated above. These amendments were made solely for the purpose of clarifying the language of the claims. The amendments are supported by the application as originally filed, and do not add new matter. Entry of these amendments is respectfully requested.

The amendments to claims 31-33 are supported by claims 1-3 of the application as originally filed. New claims 34-35 and 38-39 are supported by the specification at page 12, lines 12-22, and also by general discussion at pages 2-5 of the specification. New claims 36, 37, and 44-47 are supported by originally-filed claim 7. New claims 43 and 44 are further supported by originally-filed claims 11-23. New claims 44-47 are further supported by the specification at page 11, lines 13-22. New claims 40-43 are supported by originally-filed claims 4-6.

### **III. Sequence Rules**

At page 2 of the Office Action, indication was made that the application fails to comply with the requirements of 37 CFR 1.821 through 1.825. Applicants submit herewith a substitute Sequence Listing in paper and computer readable form. Also enclosed are a copy of the Notice to Comply With Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures, and a Statement that the content of the paper and computer readable copies are the same and include no new matter. Entry of the substitute Sequence Listing is respectfully requested.

### **IV. Objections**

At page 2 of the Office Action, the preliminary amendment filed August 20, 2001, was objected to under 35 U.S.C. §132 because the amendment adding Examples 16-22 to the specification was regarded as new matter. The Examiner found Examples 16-22 to be lacking support for the experimental details set forth in these examples in the original specification and figures. In response, Applicants have canceled the amendment adding Examples 16-22 to the specification.

At page 3 of the Office Action, claims 32 and 33 were objected to under 37 CFR §1.75(c), as ~~being of improper dependent form for failing to further limit the subject matter of a previous claim.~~  
In response, Applicants have amended claims 32 and 33 to clarify the language of these claims and their relationship to claim 31.

### **V. Non-Art Rejections**

At pages 3-4 of the Office Action, claims 32 and 33 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the recitations of "sVpr" and "at least approximately 15 amino acids" were regarded as indefinite. In response, Applicants have clarified the language of claims 32 and 33 by amending claims 32 and 33 to identify the appropriate SEQ ID numbers, and by amending claim 33 to delete "approximately".

## **VI. Prior Art Rejections**

At page 4 of the Office Action, claims 31-33 were rejected under 35 U.S.C. §102(b) as being anticipated by de Rocquigny et al. (Journal of Biological Chemistry 272:30753-9, 1997). At pages 4-5 of the Office Action, claims 31-33 were rejected under 35 U.S.C. §102(e) as being anticipated by Terman, U.S. Patent No. 6,340,461. In view of the amendments clarifying the language of claims 31-33, these rejections are now moot.

## **VII. Conclusion**

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

GATES & COOPER LLP  
Attorneys for Applicant(s)

Howard Hughes Center  
6701 Center Drive West, Suite 1050  
Los Angeles, California 90045  
(310) 641-8797

Date: July 5, 2002

KSC/sjm

G&C 151.2-US-WO

By: 

Name: Karen S. Canady  
Reg. No.: 39,927

APPENDIX B PARAGRAPHS IN MARKED-UP FORM



Please replace the paragraph beginning on page 6, line 26 - page 7, line 4 with the following:

sVpr<sup>1-96</sup>:

H - Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn -  
 Glu - Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His -  
 Phe - Pro - Arg - Ile - Trp - Leu - His - Asn - Leu - Gly - Gln - His - Ile - Tyr - Glu - Thr - Tyr - Gly  
 - Asp - Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln - Gln - Leu - Leu -  
 Phe - Ile - His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg - Ile - Gly - Val - Thr - Arg - Gln -  
 Arg - Arg - Ala - Arg - Asn - Gly - Ala - Ser - Arg - Ser-OH (SEQ ID NO: 1)

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Please replace the paragraph on page 7, lines 6-10 with the following:

sVpr<sup>1-47</sup>:

H-Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn - Glu  
 - Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His - Phe -  
 Pro - Arg - Ile - Trp - Leu - His - Asn - Leu - Gly - Gln - His - Ile - Tyr-NH<sub>2</sub> (SEQ ID NO: 2)

Please replace the paragraph on page 7, lines 12-16 with the following:

sVpr<sup>48-96</sup>:

Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln -  
 Gln - Leu - Leu - Phe - Ile - His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg - Ile - Gly - Val -  
 Thr - Arg - Gln - Arg - Arg - Ala - Arg - Asn - Gly - Ala - Ser - Arg - Ser-OH (SEQ ID NO: 3)

Please replace the paragraph on page 7, lines 18-20 with the following:

sVpr<sup>1-20</sup> as mutant sVpr<sup>1-20</sup>(Asn<sup>5,10,14</sup>):

H-Met - Glu - Gln - Ala - Asn - Glu - Asp - Gln - Gly - Asn - Gln - Arg - Glu - Asn - Tyr - Asn -  
Glu - Trp - Thr - Leu-NH<sub>2</sub> (SEQ ID NO: 8), and

Please replace the paragraph on page 7, lines 22-24 with the following:

sVpr<sup>21-40</sup> as mutant sVpr<sup>21-40</sup>(Asn<sup>35</sup>):

H-Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His - Phe - Asn - Arg - Ile -  
Trp - Leu - His-NH<sub>2</sub> (SEQ ID NO: 9),

Please replace the paragraph on page 8, lines 1-3 with the following:

sVpr<sup>11-25</sup>:

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H-Gln - Arg - Glu - Pro - Tyr - Asn - Glu - Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu-NH<sub>2</sub>  
(SEQ ID NO: 4),

Please replace the paragraph on page 8, lines 5-7 with the following:

sVpr<sup>41-55</sup>:

H-Asn - Leu - Gly - Gln - His - Ile - Tyr - Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala-NH<sub>2</sub> (SEQ  
ID NO: 5),

Please replace the paragraph on page 8, lines 9-11 with the following:

sVpr<sup>46-60</sup>:

H-Ile - Tyr - Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile-NH<sub>2</sub> (SEQ ID NO: 6),

Please replace the paragraph on page 8, lines 13-15 with the following:

sVpr<sup>56-70</sup>:

H-Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln - Gln - Leu - Leu - Phe - Ile-NH<sub>2</sub> (SEQ ID NO: 7),

Please replace the paragraph on page 8, lines 17-19 with the following:

sVpr<sup>66-80</sup>:

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H-Gln - Leu - Leu - Phe - Ile - His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg-NH<sub>2</sub> (SEQ ID NO: 10),

Please replace the paragraph on page 8, lines 21-23 with the following:

sVpr<sup>76-96</sup>:

H-Cys - Arg - His - Ser - Arg - Ile - Gly - Val - Thr - Arg - Gln - Arg - Arg - Ala - Arg - Asn - Gly - Ala - Ser - Arg - Ser-OH (SEQ ID NO: 11).

Please replace the paragraph on page 14, lines 9-17 with the following:

molecular weight: calculated: 11378

found: 11381

H - Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn - Glu  
- Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His - Phe -  
Pro - Arg - Ile - Trp - Leu - His - Asn - Leu - Gly - Gln - His - Ile - Tyr - Glu - Thr - Tyr - Gly - Asp  
- Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln - Gln - Leu - Leu - Phe - Ile  
- His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg - Ile - Gly - Val - Thr - Arg - Gln - Arg -  
Arg - Ala - Arg - Asn - Gly - Ala -  
Ser - Arg - Ser - OH (SEQ ID NO: 1).

Please replace the paragraph beginning on page 14, line 24 - page 15, line 2 with the following:

Example 4:

$\text{Vpr}^{1-47}$

in analogy to examples 1 to 3.

molecular weight: calculated: 5728

found: 5728.8

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H - Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn -  
Glu - Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His -  
Phe - Pro - Arg - Ile - Trp - Leu - His - Asn - Leu - Gly - Gln - His - Ile - Tyr - NH<sub>2</sub> (SEQ ID NO:  
2).

Please replace the paragraph on page 15, lines 5-11 with the following:

Example 5:

$\text{Vpr}^{48-96}$

in analogy to examples 1 to 3.

Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln -  
Gln - Leu - Leu - Phe - Ile - His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg - Ile - Gly - Val -  
Thr - Arg - Gln - Arg - Arg - Ala - Arg - Asn - Gly - Ala - Ser - Arg - Ser - OH. (SEQ ID NO: 3).

Please replace the paragraph on page 15, lines 13-19 with the following:

Example 6:

$\delta V_{pr}^{1-20}$

in analogy to examples 1 to 3.

H - Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn -  
Glu - Trp - Thr - Leu - NH<sub>2</sub> (SEQ ID NO: 8).

Figure 5:  $\delta V_{pr}^{1-20}$  - mass spectrum (% int. and molecular weight) (%Int. 10% = 111 mV[sum= 9505 mV]).

Please replace the paragraph on page 15, lines 21-25 with the following:

Example 7:

$\delta V_{pr}^{1-20}(\text{Asn}^{5,10,14})$

in analogy to examples 1 to 3.

H - Met - Glu - Gln - Ala - Pro - Glu - Asp - Gln - Gly - Pro - Gln - Arg - Glu - Pro - Tyr - Asn -  
Glu - Trp - Thr - Leu - NH<sub>2</sub> (SEQ ID NO: 8).

Please replace the paragraph beginning on page 15, line 27 - page 16, line 3 with the following:

Example 8:

$\delta V_{pr}^{21-40}$

in analogy to examples 1 to 3.

Wildtype-sequence:



H - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His - Phe - Asn - Arg - Ile  
- Trp - Leu - His - NH<sub>2</sub> (SEQ ID NO: 9).

Please replace the paragraph on page 16, lines 6-10 with the following:

Example 9:

$\Delta V_{pr}^{21-40}(\text{Asn}^{35})$

in analogy to examples 1 to 3.

H - Glu - Leu - Leu - Glu - Glu - Leu - Lys - Ser - Glu - Ala - Val - Arg - His - Phe - Asn - Arg - Ile  
- Trp - Leu - His - NH<sub>2</sub> (SEQ ID NO: 9).

Please replace the paragraph on page 16, lines 12-16 with the following:

Example 10:

$\Delta V_{pr}^{11-25}$ :

in analogy to examples 1 to 3.

H - Gln - Arg - Glu - Pro - Tyr - Asn - Glu - Trp - Thr - Leu - Glu - Leu - Leu - Glu - Glu - NH<sub>2</sub>  
(SEQ ID NO: 4).

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Please replace the paragraph on page 16, lines 18-22 with the following:

Example 11:

$\Delta V_{pr}^{41-55}$ :

in analogy to examples 1 to 3.

H - Asn - Leu - Gly - Gln - His - Ile - Tyr - Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala - NH<sub>2</sub>  
(SEQ ID NO: 5).

Please replace the paragraph on page 16, lines 24-28 with the following:

Example 12:

$\delta Vpr^{46-60}$ :

in analogy to examples 1 to 3.

H - Ile - Tyr - Glu - Thr - Tyr - Gly - Asp - Thr - Trp - Ala - Gly - Val - Glu - Ala - Ile - NH<sub>2</sub> (SEQ ID NO: 6).

Please replace the paragraph on page 17, lines 1-5 with the following:

Example 13:

$\delta Vpr^{56-70}$ :

in analogy to examples 1 to 3.

H - Gly - Val - Glu - Ala - Ile - Ile - Arg - Ile - Leu - Gln - Gln - Leu - Leu - Phe - Ile - NH<sub>2</sub> (SEQ ID NO: 7).

Please replace the paragraph on page 17, lines 7-11 with the following:

Example 14:

$\delta Vpr^{66-80}$ :

in analogy to examples 1 to 3.

H - Gln - Leu - Leu - Phe - Ile - His - Phe - Arg - Ile - Gly - Cys - Arg - His - Ser - Arg - NH<sub>2</sub> (SEQ ID NO: 10).

Please replace the paragraph on page 17, lines 13-17 with the following:

Example 15:

$\delta Vpr^{76-96}$

in analogy to examples 1 to 3.

H-Cys - Arg - His - Ser - Arg - Ile - Gly - Val - Thr - Arg - Gln - Arg - Arg - Ala - Arg - Asn - Gly - Ala - Ser - Arg - Ser - OH (SEQ ID NO: 11).

APPENDIX B: CLAIMS IN MARKED-UP FORM

31. (Amended) A synthetic peptide comprising a regulatory virus protein R (Vpr) of the human immunodeficiency virus type 1(HIV-1) (SEQ ID NO: 1).

32. (Amended) [The] A fragment of the synthetic peptide of claim 1, [comprising] consisting of a peptide selected from the group consisting of:

(a) a [96] 20 amino acid Vpr protein [(sVpr<sup>1-96</sup>)] (sVpr<sup>1-20</sup> or sVpr<sup>21-40</sup>; SEQ ID NO: 8 and 9, respectively);

(e) a 47 amino acid N-terminal peptide (sVpr<sup>1-47</sup>);

(f) a 49 amino acid long C-terminal peptide (sVpr<sup>48-96</sup>); or

(g) a[.] fragment of at least [approximately] 15 amino acids of any one of (a)-(c).

33. (Amended) The synthetic peptide fragment of claim 32, wherein the fragment [comprises  
sVpr<sup>1-20</sup> or sVpr<sup>21-40</sup>] consists of:

(a) sVpr<sup>11-25</sup> (SEQ ID NO: 4);

(b) sVpr<sup>41-55</sup> (SEQ ID NO: 5);

(c) sVpr<sup>46-60</sup> (SEQ ID NO: 6); or

(d) sVpr<sup>56-70</sup> (SEQ ID NO: 7).